Message

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Sent: 3/18/2019 1:52:11 PM
To: timothya.taylor@state.co.us; Jennifer Mattox - CDPHE [jennifer.mattox@state.co.us]; timothy.sharp@state.co.us; jeremy.neustifter@state.co.us
Subject: CO AIMM Meeting - Follow-up from 3/14/19 Call

Tim, Jen and Jeremy –

I captured some notes from our AIMM meeting last week and sent to OAQPS folks – see their responses below …

I sat in on the monthly CO AIMM Team meeting yesterday. They had an OGI camera manufacturer (Konica Minolta) come in to provide CO an update on their OGI camera and discuss requirements for listing their camera on the CO AIMM web page as an example OGI camera. The price is ~$150-180k (it sees visible background with color-coded hydrocarbon IR image on top, color-coded for gradation in concentration).

I mentioned the work Jason had been involved in with ERG, "Technical Support Document - Optical Gas Imaging Protocol (40 CFR Part 60, Appendix K)" which included testing of the FLRI GF-320 and Opgal OGI cameras. **Has 40 CFR part 60 Appendix K Been Codified?** Apparently, OGI camera manufacturers are going to NPL lab in the United Kingdom for testing.
No, Appendix K has not been proposed at this point, although MTG (Measurement Technology Group) has continued to do some work studying OGI.

Is NPL lab testing (or any testing) relevant? Or, can any OGI camera be used as long as it meets requirements of 60.5397a (c)(7)(i) through (vii)?
(c)(7)(i) Verification that your optical gas imaging equipment meets the specifications of paragraphs (c)(7)(i)(A) and (B) of this section. This verification is an initial verification and may either be performed by the facility, by the manufacturer, or by a third party. For the purposes of complying with the fugitives emissions monitoring program with optical gas imaging, a fugitive emission is defined as any visible emissions observed using optical gas imaging.

(A) Your optical gas imaging equipment must be capable of imaging gases in the spectral range for the compound of highest concentration in the potential fugitive emissions.

(B) Your optical gas imaging equipment must be capable of imaging a gas that is half methane, half propane at a concentration of 10,000 ppm at a flow rate of ≤60g/hr from a quarter inch diameter orifice.

Manufacturers are not required to have their cameras third party (NPL or otherwise) certified. The verification can be performed by the manufacturer or by the facility using the camera. I think manufacturers have been using NPL because they've done it before, and as such, are obviously set up to perform testing. Also, NPL has done work for some of the other manufacturers to set up operating windows, which helps with the development of the monitoring plans. Also, It probably lends more credence to some people to see an independent verification.

In the CO AIMM meeting, there was also discussion on a methane-only detection camera, FLIR GF77 (https://www.flir.com/products/gf77/). It is long-wave IR and not cooled so cheaper at ~$39k but it has ~4X less sensitivity than GF-320. If it can image a gas that is half methane, half propane at a concentration of 10,000 ppm at a flow rate of ≤60g/hr from a quarter inch diameter orifice, **could it be used for NSPS OOOOa LDAR compliance?**
We can't really stop them from using something that meets the requirements of the rule. But it also has to image gases in the spectral range of the compound of highest concentration in the potential fugitives…if for some equipment that isn't methane, they need to verify that the compound of interest falls in the spectral range. It looks like the GF77 is in the middle of what has traditionally been FLIR's MW and LW cameras with a

spectral range of 7-8.5 um. Propane does have a peak in that range, but it's not as intense as the peak around 3.5 um. I would be interested in knowing if it passes. All that to say, we can't stop people from using cameras that meet the requirements of the rule, but it needs to meet all the requirements of the rule.

Regarding the new FLIR camera, I had a discussion a few weeks ago with Craig O'Neill from FLIR. He stated the GF77 is 5 times less sensitive to methane and 50 times less sensitive to propane. They have done some initial testing but they are unable at this time to get it to meet the requirements of OOOOa. They said they've been marketing it more towards natural gas power plants, biomass plants, biogas plants, landfill gas-to-energy operations, and existing sources in oil and gas since they do not have the specifications that are in OOOOa. You should probably let CO know that the manufacturer has stated that particular model does not meet the requirements of OOOOa at this time.

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